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The original drawing of DATURA METELOIDES

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TAXONOMIC HISTORY OF PERENNIAL SOUTHWESTERN DATURA METELOIDES

JOSEPH EWAN

(Plate 838)

The native perennial Southwestern *Datura* variously called the "Sacred Datura" (*Kearney*), "Indian Apple" (*Castetter*) or "Tolguacha" (*Jepson*) carries a botanical name which rests, not upon an actual herbarium specimen, but upon a hastily executed copy of a Sessé and Mociño drawing. This fact in itself need not

concern us unduly since several Mexican plants rest nomenclatorially in like manner upon these drawings which then serve as "types". However, the original description of *Datura meteloides* DC., the current botanical name of this plant, disagrees in several particulars from the living plant, especially in the characters of the flower. Yet this name cannot be shown to be a misapplied binomial because no other species of *Datura* has been found in central Mexico which agrees with the original description[1] nor with the drawing upon which it is based. In short, the drawing which serves as the type in this instance is faulty but still must apparently serve as the nomenclatural basis of the name given by deCandolle. The alternative, which may be desirable, would be to relegate deCandolle's name to the list of *Nomina confusa* and take up the next legitimately published name in the taxonomic history of the plant. This is, beyond question, Eduard Regel's name *Datura Wrightii*, published by Regel upon his recognition of the discrepancy that exists between the original description of *D. meteloides* and the plant introduced into European horticulture in the late 1850's under that name. *Datura Wrightii* rests, although not upon an ascertainable type as designated by Regel, yet upon a thoroughly representative and extant collection which may be designated the lectotype.

This paper aims to bring together the cogent facts relative to this rather intricate nomenclatural situation for a plant well known to Southwestern field botanists, to ethnobotanists[2], to pharmacologists, and to cytogeneticists who must use valid and verifiable binomials in their expanding and important research in *Datura*.

Taxonomic History of Datura meteloides DC.

Our native perennial *Datura* received its first botanical name in manuscript from Alphonse deCandolle in reference to its general resemblance to *D. Metel* L. of India. This name was taken up by Dunal and published in the *Prodromus* in 1852.[3] A close analysis of the original description reveals several points of difference in the flower-morphology over our Southwestern *Datura*. These may be tabulated as follows:

[1] Cf. synopsis by Safford, *Jour. Wash. Acad. Sci.* **11**: 173–189. 1921.

[2] Cf. Safford, *Ann. Rept. Smiths. Inst.* 1920: 550–555. 1922; also, Castetter, *Univ. N. Mex. Bull. biol. ser.* **4**: 26. 1935.

[3] *Prodromus* **13** (pt. 1): 544. 1852.

Datura meteloides As described by deCandolle	Datura meteloides As known from wild plants in the field
Calyx-lobes very unequal	*Calyx-lobes* equal or nearly so
Fruiting calyx deciduous	*Fruiting calyx* persistent
Leaf-blades sinuate to strictly entire, equilateral at base	*Leaf-blades* coarsely sinuate-dentate, usually equilateral at base
Corolla-limb short, scarcely flaring	*Corolla-limb* ample, distinctly trumpet-flaring
Capsule thinly spinose	*Capsule* closely beset with slender subacicular spines

Datura meteloides DC. rests upon a Sessé and Mociño drawing of a plant recorded as native of "calidis Novae Hispaniae regionibus", the frequent designation for central Mexico in the early history of exploration. In verifying the application of the name to the Californian plants of this species I submitted a recent collection (*Ewan 10963*) for comparison with the type in the deCandollean Herbarium. I am indebted to Dr. Baehni and to Dr. Hochreutiner for their assistance in making the comparison and for tabulating the differences for me. The more significant differences have been included in the foregoing table. A photograph of the "type", that is, the drawing (Icones no. 919), taken by Mr. J. F. Macbride, and preserved in the deCandollean Herbarium at Geneva has been kindly furnished by Dr. Clifford C. Gregg of Field Museum, and is reproduced here as Plate 838. Presumably the drawing was prepared from an actual plant-specimen, most likely collected by Mociño. The actual place of collection, in fact the origin of the plant as to its garden-source or other matters, is now unknown. Some suggestions as to the botanizing activities of Sessé and Mociño over the Mesa Central of Mexico have been offered by Sprague.[4] The states of Jalisco and Michoacan especially were visited by them, but the states of Mexico, Morelos, Guerrero, Guanajuato and Queretaro were also visited before 1792.

The unfinished character of the Sessé and Mociño drawing is understandable when the history of these drawings is recalled.[5] It is well known that the originals were loaned to August Pyramus deCandolle by Mociño and recalled on short notice for

[4] *Kew Bull. Misc. Inform.* 1926: 417. 1926.
[5] Cf. Standley, *Contrib. U. S. Nat. Herb.* **23**: 16. 1920.

their return to Spain. Recognizing their value as a documentary record of the Mexican flora, deCandolle enlisted the help of the citizenry of Geneva in making copies of the Mociño drawings before their return. It is a tribute both to deCandolle and to the townspeople who came to his aid that these drawings were preserved to us. But doubtless some of the errors in the *Datura* plate may be attributable to the hurried work of these mostly non-botanical copyists.

Since no collection other than the Sessé and Mociño drawing was cited by deCandolle in the original description, it is impossible to select another collection as a lectotype for *D. meteloides*.

No localized or endemic species of *Datura* from the Mesa Central has been detected with which it might be confused as a misinterpreted name. The Mexican collections seen agree in essential characters with those from our Southwestern states. Except for Regel's name as hereinafter discussed, botanists have quite uniformly accepted deCandolle's name without question; indeed, they have seldom mentioned Eduard Regel's binomial even in synonomy. Safford does not discuss the problem in his interesting and well documented account of the genus *Datura*.[6]

In April, 1855, Thomas Antisell collected what is reported as "Toloachi" between "San Bernardino and San Gabriel" in San Bernardino Valley on the coastal plain of southern California. John Torrey in 1856, in publishing an account of the Antisell collections[7], gave this *Datura* its first varietal name, somewhat falteringly, "*D. Metel* L. var. *quinquecuspida* Torr." This name is nearly without accompanying description; it is a *nomen subnudum*. This fact would indicate that Torrey had not recognized deCandolle's name as applicable to the Californian plant in question.

Taxonomic History of Datura Wrightii Regel

Charles Wright made a good collection, with seeds, of Tolguacha in western Texas in June, 1849 (his no. 526), but since the *Solanaceae* was not reached in the sequence of families treated in *Plantae Wrightianae* (Part I, 1850, published as Smithsonian Contrib. to Knowledge, vol. 3, art. 5), Wright's collection was not noticed prior to the publication of deCandolle's name (1852).

[6] *Jour. Wash. Acad. Sci.*, l. c.

[7] *Pac. RR. Rept. bot. sect.* 7: 18. 1856.

Asa Gray communicated Wright's seeds, however, to the French horticulturist, M. Louis Vilmorin, in 1855 under the name "*Datura meteloides* DC.". Upon its flowering abroad both the Flores des Serres and the Revue Horticole carried illustrated accounts of the novelty in 1857.[8] Especially stressed along with other comparisons were the conspicuous, showy flowers of this new *Datura* over others in cultivation. Vilmorin-Andrieux & Cie. in the third edition (no date) of their *Fleurs de Pleine Terre* give "False Datura Metel" as a French vernacular name but do not comment upon its introduction.

The German botanist Eduard August von Regel (1815–1892) is well known as the founder of the carefully edited horticultural periodical *Gartenflora*. Founded in 1852 this "Monatsschrift" was devoted to German, Russian and Swiss gardens and garden-flowers. It was in July 1859 that Regel published in the *Gartenflora*[9] a description of the *Datura* recently introduced by Vilmorin and now recognized as not conforming with the description of *D. meteloides* DC. Though Regel was at the time Director of the then Imperial Botanic Garden at St. Petersburg, the *Datura* had been grown at Zurich prior to his rather sudden departure for St. Petersburg. Though there are Regel collections made up to the year 1856 at Zurich,[10] there was not preserved a collection of the garden-grown *Datura* which he described in 1859. Many details relative to the description of new species were left unfinished at Zurich, including herbarium-labelling, upon his departure for the directorship at St. Petersburg. In describing *Datura Wrightii* and contrasting it with *Datura meteloides* Regel enumerates the differences as observed in the plants grown at the Botanical Garden at Zurich. He does not refer to the nativity of the Vilmorin seeds beyond the misstatement that the new *Datura* is a native of California. The name is given as "*Datura Wrightii* Hort." but I am unable to locate any previous use of this name before Regel's publication of it in 1859. By inference one must conclude that he knew the seeds were to be credited to Charles Wright, or, possibly, this name may have reached him as a manuscript name when the seeds were received. A search through pertinent seed-lists not available to me now might demonstrate this to be a fact.

[8] The author is indebted to Dr. L. H. Bailey for a photostat of one of these accounts.
[9] *Gartenflora* **8**: 193. t. 260. 1859.
[10] Cf. Alphonse deCandolle, *Phytographie* 442. 1880.

In any case, Regel accurately describes and excellently illustrates (t. 260) our Southwestern Tolguacha.

The citation of "Hort." given the binomial by Regel may, I believe safely, be replaced by Regel as author-citation. To be sure, Asa Gray[11], among others, cites the name as Regel published it. More recently *Index Londinensis* assigns the name to Regel. The fact that the author of the binomial himself later[12] accepts the name as of his authorship would clear away possible nomenclatural difficulties on this small point. The fact that the binomial has never been confused under either citation makes the transfer even more accurate.

But the typification of Regel's name is not so simple. Unfortunately Regel apparently did not preserve a specimen of the cultivated plant grown at Zurich. At least Dr. Walo Koch, Docent and Conservator of botanical collections at Eidgenössische Technische Hochschule, informs me[13] that no pertinent collection exists at Zurich. Nor is there a collection at Leningrad which might serve as the type of *D. Wrightii* Regel. There is a single sheet at Leningrad, which Prof. Boris K. Schischkin, Director of the Institute and Botanic Garden, kindly sent me on loan, which might seem to be cogent. It is, however, a collection of *D. Metel* and has been so labelled on the form-label reading "Ex horto bot. Petropolitano". The only data on the label otherwise is as follows: "(1764 m. Ausfeld s[ub]n[omine] D. Wrightii) $18\frac{1}{IX}64$. [Ferdinand]v$_o$ v[on] Herder". Hence this sheet is not involved, I believe, in our problem of establishing the type of Regel's published name. The Charles Wright sheet (his no. 526) from western Texas, as mentioned above, may be satisfactorily designated as the lectotype of *Datura Wrightii*, especially since the seeds which made known the plant in European gardens were also gathered by Wright. Wright's collection came from the head of Turkey Creek at the border of Uvalde and Kinney Cos., Texas, on June 29/30, 1849, en route from San Antonio to El Paso on his first expedition, if the number 526 on the sheet in the U. S. National Herbarium (60043), written on the label in pencil by Asa Gray, refers to the field-collection number.

[11] A. Gray, *Synopt. Fl.* 2 (pt. 1): 240. 1878; ed. 2. 240. 1886.
[12] *Gartenflora* 30: 218. zinco cut. 1881. Appears as "D. Wrightii Rgl."
[13] Letter of 10 Jan. 1939.

There is the possibility that in this instance, as Wooton[14] pointed out, the "plants were not distributed under the collection numbers." Until further information is at hand, Turkey Creek, Uvalde-Kinney county line, Texas, may be accepted as the type locality of *Datura Wrightii* Regel.

Recommendations

a) I recommend that *Datura meteloides* DC. be accepted as a *nomen emendandum* and continued in use with such corrections made in descriptions as are necessary to bring the concept into accord with the living plant.

b) It is desirable that record of such an emended status be made by citing the binomial as "*D. meteloides* DC. *emend.*"

c) I recommend that "*D. meteloides* DC." be considered by the Committee on Nomenclature of the International Botanical Congress; and if a *nomina conservanda* list for species, apart from that for genera, meets with support from the Congress, that the binomial be proposed for that list to be acted upon at the next regular meeting of the Congress.

d) In the event that *D. meteloides* DC. is relegated to the list of *nomina confusa* by the Congress, I recommend that *Datura Wrightii* Regel be taken up as the next available name for this species.

e) I recommend that *Charles Wright 526* (USNH 60043) be accepted as the lectotype, as designated herein, and that accordingly Turkey Creek, Uvalde-Kinney Co. line, Texas, be taken as the type locality for *D. Wrightii* Regel.

University of Colorado,
Boulder

IS ERIGERON CAROLINIANUS A VALID AMERICAN SPECIES?

M. L. Fernald

In his sumptuous Hortus Elthamensis, ii. 412, t. CCCVI, fig. 394 (1732), Dillenius described and illustrated his *Virga aurea carolinensis, Linariae monspessulanae foliis;* and upon this account alone Linnaeus, Sp. Pl. 863 (1753), based his *Erigeron carolinianum*, assumed by Linnaeus from the Dillenian phrase to have its habitat in Carolina. *Erigeron carolinianus* was one of several plants given binomials by Linnaeus, probably without first-hand knowledge of them, and assumed to be American.

Naturally American botanists began guessing what Dillenius might have had. Most of them, unfortunately, did not read what he said. Thus Pursh, Fl. Am. Sept. ii. 535 (1814), placed

[14] Wooton, *Bull. Torrey Bot. Club* **33**: 561–566. 1906; cf. also, Geiser, *Field & Lab.* **4**: 23–32. 1935, for valuable additions to Wooton's paper.

the yellow-flowered Dillenian plant with flowers all ligulate, the stem "two cubits and more high, and at base as thick as a small finger", in the synonymy of the delicate filiform-stemmed and cespitose *Erigeron hyssopifolius* Michx. (0.5–3 dm. high, with 1 or few terminal heads with central 5-toothed corollas of all *Astereae*, the long ligules lilac-purple to white) which occurs on calcareous rock from Newfoundland to Mackenzie, south to Nova Scotia, New Brunswick, central Maine, northern Vermont, northern New York, Ontario and northern Michigan. By so disposing of *E. carolinianus*, Pursh gave the boreal *E. hyssopifolius* the impossible range: "In low grounds: Canada to Carolina . . . rays yellow." That was a hopelessly bad guess but, really, no worse than those made by later authors; but in order to understand the problem it is necessary to quote the pertinent points in the long Dillenian account (freely translated):

Stem erect, 2 cubits and more high, as thick as the little finger toward the root, terete, reddish below, striate, clothed from base to summit with crowded very narrow entire leaves, similar to those of *Linaria odorata* J. Bauhin, yet not glabrous but subhirsute; stems toward the summit emitting frequent leafy branches with leaves like the others but smaller, these branches with 1–few flowers (heads); involucre oblong, slender, scaly (6–7 mm. high, 3–4 mm. thick), its ligules ("semi-flosculi") small and yellow (fig. 1) the disk-florets (figs. 2 and 3) not stellately divided, as in other species, but entire at summit, with a ligule at one side; achenes with slender pappus . . . Odor of *Conyza Canadensis* (*E. canadensis*).

Then Dillenius added the significant note that in the greenhouse the plant flowered in late November, the flowers appearing to him to be not natural; in other words, the plant seemed to Dillenius to be a monstrosity[1] (possibly due to aphids or fungi).

Returning to early attempts to place the Dillenian plant, in 1826 Cassini (a famous generic splitter in the *Compositae*), setting up the new genus *Phalacroloma* for *Erigeron annuus* and *strigosus*, said under his *P. obtusifolia* Cass. in Dict. Sci. Nat. xxxix. 405 (1826), *i. e. Erigeron strigosus:* "Nous avons fait cette description spécifique, et celle des caractères génériques, sur un échantillon sec, incomplet et en très-mauvais état, qui se trouve dans l'herbier de M. Desfontaines, où il est etiqueté avec doute *Erigeron carolinianum* ou *hyssopifolium*"—showing how easily

[1] In Hibernaculo Elthamensi floruit anno 1727. Novembris fine, cumque tam fero flores protulerit, dubium mihi visum, num flosculi essent naturales, & an non alia tepidiore tempestate, flosculorum aliorum instar aperirentur, si nempe maturius floreret.

segregate-genera could be proposed long before the so-called "Neo-American" era. Then in 1836, Cassini's American rival at generic splitting, Rafinesque, published the genus *Diplemium* Raf. Fl. Tellur. ii. 50, with four species: *Erigeron carolinianum* L.; *E. nervosum*, the *E. nervosus* Willd., which is *Chrysopsis nervosa* (Willd.) Fernald in Rhodora, xliv. 471 (1942); *Erigeron quercifolius* Lam. and *E. strigosus* Muhl.—the combinations under *Diplemium* not then made. Of these guesses Torrey & Gray, both wise and cautious, wrote: "*E. Carolinianum*, of Linnaeus, is wholly founded on the Virga-aurea Caroliniana, &c. *Dill. Elth. t.* 306, *f.* 394, a yellow-flowered plant, which no botanist has succeeded in identifying. It has nothing in common with the Phalacroloma obtusifolium of Cassini (which is Erigeron strigosum), nor with the Erigeron hyssopifolium, *Michx.* . . . This confusion commenced with Pursh, who erroneously adduced the figure of Dillenius and the E. Carolinianum as synonyms of the E. hyssopifolium of Michaux."—Torr. & Gray, Fl. ii. 180 (1841).

It would have been well if Torrey & Gray's note had finally disposed of the freaky plant which Dillenius himself thought to be abnormal. Asa Gray, in his search of the old specimens preserved at Oxford, found, according to memoranda accumulated by Dr. Stuart K. Harris when he was studying the group, the sheet from which the Dillenian description and plate were made and marked it "Est *Solidago tenuifolia* minus evoluta". Consequently, feeling that the plant belonged there, he gave it in the synonymy of the all-inclusive *S. tenuifolia* Pursh, with the note: "S. tenuifolia, Pursh. This proves to be the *Erigeron Carolinianum*, L., that is, *Virga-aurea Carol.*, &c. Dill. Elth. 412, t. 306, fig. 394."—Gray in Proc. Am. Acad. xvi. 198 (1880). This synonym was, consequently, given in the Synoptical Flora under *S. tenuifolia;* and with alacrity the Committee of the Torrey Botanical Club, without a word of clarification or any supporting citation, rushed it into print as *Solidago* "Caroliniana, (L.) (*S. tenuifolia*, Pursh)" in BSP. Prelim. Cat. 26 (1888). One has to have a good background of bibliographic data to interpret such loosely published stuff! In 1894 Greene, again with complete and most atypical faith in Gray's opinion of 1880, came out with *Euthamia caroliniana* (L.) Greene in Mem. Torr. Bot. Cl. 321 (1894), to displace *Solidago tenuifolia* Pursh and *Euthamia tenuifolia* (Pursh) Nutt.

Now it so happens that the *Solidago tenuifolia* sensu Gray, BSP. and their contemporaries and the *Euthamia tenuifolia* sensu Greene in 1894 consisted of two quite definite species: (1) true *S. tenuifolia* Pursh as to description "foliis . . . obsolete trinervibus"—the plant of New Jersey, extending north into Nova Scotia, New England, etc., and rapidly passing out southward; and (2) *S. minor* (Michx.) Fernald in Rhodora, x. 93 (1908)*S. lanceolata*, β. *minor* Michx. Fl. Bor.-Am. ii. 116 (1803) "in pascuis circa *Charlestown* [South Carolina]," *S. tenuifolia* Pursh, in part, not as to description, and *Euthamia minor* (Michx.) Greene, Pittonia, v. 78 (1902)—*S. minor*, superabundant in the Southeastern States, becoming rare as far north as southern New Jersey. As pointed out by me in 1908 it is "Distinguished from *S. tenuifolia* Pursh, which has flat leaves 2–6 mm. wide and the campanulate involucre 2–3 mm. broad, by its almost acicular leaves (the middle cauline 1–1.5 mm. wide) and its nearly cylindric acute-based involucre only 1–1.5 mm. broad." With two quite distinct and geographically usually isolated species included in Pursh's original *S. tenuifolia* and in the concepts of Gray, Britton and others and of Greene in 1894, the substitution for it of *S. caroliniana* (L.) BSP. or *Euthamia caroliniana* (L.) Greene leaves much in need of clarification, for true *S. tenuifolia* probably does not reach even North Carolina.

Unhappily, however, the name *S. minor* (Michx.) Fernald, used in Gray's Manual, ed. 7 and by Mackenzie in Small's Manual, is antedated by *S. minor* Mill. (1768). Another name for the characteristic southeastern plant has to be found. Of that more later.

In 1902, furthermore, Greene entered the lists. A single southeastern species, *Solidago* or *Euthamia minor* was not enough. He took up *E. tenuifolia* (Pursh) Greene, Pittonia, v. 77 (1902) for the northern species, made the combination *E. minor* for the common southeastern species, described by him as having the stem "corymbosely parted at about the middle into very slender more or less fastigiate branches all copiously . . . floriferous: leaves . . . very narrowly linear, pungently acute, 1-nerved, . . . glabrous throughout, scarcely even the margin scaberulous." But Greene did not stop there; he proceeded to split the southeastern species into the artificial segregates

(photographs of the types secured and presented to the Gray Herbarium by Dr. Harris), *E. microcephala*, from the Carolinas and Georgia, and *E. microphylla* from southern Mississippi. Furthermore, he decided that one number, more loosely branching than most *E. minor* but with broadly corymbose summit, *Tracy*, no. 4748 from Biloxi, Mississippi, was "a most satisfactory herbarium representative of *E. Caroliniana*," Greene then repudiating his and others' misidentification of *Erigeron carolinianus* in characteristically dramatic terms: "In so far as it is connected with a low plant with a corymbose mode of branching that is common both at the North and the South, the above name is misapplied. A critical enquiry into the originals of *Erigeron Carolinianus*, Linn. reveals conclusively the fact that it is a plant exceedingly unlike the *Solidago tenuifolia* of Pursh, with which all authors for eighty years past have blindly agreed in confusing it. Doubtless all that Linnaeus knew about the plant in question he learned from the figure and description that had been published in 1732 by Dillenius. He describes it, evidently from the plate of Dillenius, as an *Erigeron* with panicled stem, solitary heads at the ends of the branchlets . . . It is so exactly a paniculate 'Erigeron' that he places it next to *E. Canadensis*."

When, however, Greene confidently identified the Tracy specimen with the really very different Dillenian plant he overlooked several important differences. In the first place the habit, for Dr. Harris's photograph shows that the *Tracy* specimen which Greene found "a most satisfactory herbarium representative of *E. Caroliniana*", has the fastigiately paniculate-corymbose inflorescence nearly as broad as high and, as Greene admits, "much more broadly [branching] than in the cultivated specimen which Dillenius figured from"—as if cultivation changed a broadly corymbiform inflorescence with many-headed branches several times longer than the subtending leaves into a slenderly virgate-racemiform one with branches shorter than the subtending leaves and the solitary terminal heads greatly enlarged! Another point was overlooked: the Dillenian plate shows the solitary involucres 6–7 mm. high and 3–4 mm. thick; an involucre of *S. minor* (including *Tracy*, no. 4748) more than 4 mm. high and 1.5 mm. thick would be very exceptional. And what of the flowers of the Dillenian plant, all ligulate, the disk-corollas "non stellatim

divisi, ut in aliis speciebus, sed integri in summitate, ab altero latere clausi, ab altero aperti, unde stylus erumpit in duo corniculula longiuscula divisus"? In *S. minor* (including Greene's supposed *Euthamia caroliniana*) the style is included or at most only short-exserted above the regularly 5-toothed limb of the disk-corolla.

Altogether Greene's guess is no better than the others. The sad situation is, that, never having previously looked into the matter, I have been accepting the statements of others (I never learn not to do so) and have distributed many specimens of *Solidago minor* under the inadmissible name *S. caroliniana*. Dr. Harris was evidently misled, as shown in his manuscript discussion of the matter, by accepting as the type of the Dillenian and Linnean species, not the plant described by Dillenius but another specimen in the Dillenian herbarium which is typical *S. minor*. From Dr. Harris's unpublished manuscript I am allowed to copy the following item which explains his interpretation and the labeling of much material as *S. caroliniana*: "In the summer of 1935 Mr. C. A. Weatherby examined the Dillenian material of *Erigeron carolinianum* and found that there were three sheets, two of which could have served as a basis for the plate. His notes show that . . . the heads, while immature, are turbinate and the involucral bracts oblong, abruptly acute and shining but not strongly glutinous. The third sheet was collected by Catesby in South Carolina in 1723 and has the normal inflorescence of the *S. caroliniana* complex, is distinctly glutinous and has the heads 3–4 mm. high. These facts seem to bear out Greene's assertion that *S. caroliniana* is distinct from *S. tenuifolia*". Even though Dillenius had in his herbarium a perfectly normal plant of *S. minor*, collected by Catesby in 1723, that cannot be admitted as the type of *Erigeron carolinianus*. The latter was based exclusively on the description and plate of Dillenius, who did not describe, mention nor illustrate the Catesby specimen. His species rests wholly on the plant raised in the greenhouse, and described or shown to have an elongate-racemose inflorescence of solitary heads twice the size of those of the corymbose specimen of Catesby and with the disk-corollas ligulate and with long-exserted style-branches. We surely cannot take as the type of a well described and clearly illustrated species a specimen which was neither described nor illustrated.

As to the identity of the Dillenian plant and the resultant *Erigeron carolinianus* L., I do not know what it was unless it was something not originally from Carolina or, as Dillenius thought, an abnormal individual. If it were the latter the name cannot stand. It is automatically excluded by Art. 65 of the International Rules: "A name or epithet of a taxonomic group must be rejected when it is based on a monstrosity".

Since the familiar name, *Solidago minor* (Michx.) Fernald is a later homonym another name must be taken up in its place. The bibliography, for which I am chiefly indebted to Dr. Harris, follows:

Solidago microcephala (Greene) Bush in Am. Midl. Nat. v. 176 (1918). *S. lanceolata,* β. *minor* Michx. Fl. Bor.-Am. ii. 116 (1803). *S. tenuifolia* Pursh, Fl. Am. Sept. ii. 540 (1814), in part. *S. caroliniana* BSP. Prelim. Cat. 26 (1888) in part; Harris in Rhodora, xlv. 413 (1943); not *Erigeron carolinianus* L., basonym. *Euthamia caroliniana* Greene in Mem. Torr. Bot. Cl. v. 321 (1894), in part, and Pittonia, v. 76 (1902) as to plant, not *Erigeron carolinianus* L., basonym. *Euthamia minor* (Michx.) Greene, l. c. 78 (1902). *Euthamia microcephala* Greene, l. c. 79 (1902). *Euthamia microphylla* Greene, l. c. (1902). *S. minor* (Michx.) Fernald in Rhodora, x. 93 (1908), not Mill. (1768). *S. microphylla* (Greene) Bush, l. c. 177 (1918). *S. Michauxii* House in N. Y. State Mus. Bull. no. 254: 695 (1924).

Another member of *Solidago,* § *Euthamia* which, unfortunately, must be rechristened is the northernmost variety of *S. graminifolia,* the extreme with relatively broad and bluntish instead of attenuate, leaves which ranges across the continent from Newfoundland and Saguenay Co., Quebec, to Hudson Bay, thence to northern Alberta, south to the Gaspé Peninsula, Quebec, northern Michigan, northern Minnesota, the Black Hills of South Dakota, the Rocky Mts. to northern New Mexico and the valleys of southern British Columbia. Dr. Harris has recently called this most boreal variety *S. graminifolia,* var. *tricostata* (Lunell) Harris in Rhodora, xlv. 413 (1943), based on *Euthamia camporum,* var. *tricostata* Lunell (1911). In doing so Dr. Harris evidently overlooked, as I did in 1913, a very much older varietal name given by Michaux in 1803 to characteristic specimens from Lake St. John, Quebec. This Michaux variety necessitates the combination

S. GRAMINIFOLIA (L.) Salisb., var. **major** (Michx.), comb. nov. *S. lanceolata* L., α. *major* Michx. Fl. Bor.-Am. ii. 116 (1803). *Euthamia camporum* Greene, var. *tricostata* Lunell in Am. Midl. Nat. ii. 59 (1911). *S. camporum* (Greene) Bush, var. *tricostata* (Lunell) Fedde in Just, Bot. Jabresb. xli. Abt. 2: 144 (1913). *S. graminifolia*, var. *septentrionalis* Fernald in RHODORA, xvii. 12 (1915). *Euthamia bracteata* Bush in Am. Mid. Nat. v. 172 (1918). *S. bracteata* Bush, l. c. 173 (1918). *S. graminifolia*, var. *tricostata* (Lunell) Harris in RHODORA, xlv. 413 (1943).

Michaux defined two varieties under *Solidago lanceolata:*

Var. α. *major:* foliis rarioribus, latiuscule
linearibus: quae CHRYSOCOMA *graminifolia.*
Linn.
— β. *minor:* foliis crebrioribus, anguste linearibus; axillis
foliosis: subglutinosa.
HAB. α. in Canada.
— β. in pascuis circa *Charlestown.*

The latter, type of *Solidago minor* (Michx.) Fernald, not Mill., the southeastern species, *S. microcephala* (Greene) Bush, has been sufficiently discussed (see p. 326). The only Canadian material under *S. lanceolata* in the Michaux Herbarium at Paris is a well preserved sheet from Lake St. John, selected by M. Metman as the type of var. α *major*. The sheet has 3 specimens, so like material of var. *tricostata* from James Bay (*Potter*, no. 46), from Red River, Minnesota (*Ballard*, no. 3108) from Leeds, North Dakota (Lunell), isotype of var. *tricostata*, and from the Black Hills (*Rydberg*, no. 770) that I detect no difference. In fact, it would have been most remarkable if Michaux, ascending the Saguenay to Lake St. John, then crossing over to Rupert River and descending that, had not found the characteristic plant of that area. The varietal name used by him is highly inappropriate for one of the smaller variations of *S. graminifolia*. He was contrasting his broad-leaved northern plant with his narrow-leaved southern one.

MENTHA ARVENSIS AND SOME OF ITS NORTH AMERICAN VARIATIONS

Sara R. Stewart[1]

A systematic study of *Mentha arvensis* L. and its varieties, var. *canadensis* (L.) Briquet, var. *lanata* Piper and var. *glabrata* (Bentham) Fernald, in North America resulted in the following observations of this group as a whole. 1. There was no noticeable difference in size, shape or sculpturing of the nutlets. 2. There was considerable variation within the same geographical range in (a) leaf-shape and dentation, (b) degree of hairiness of the stem, (c) length of pedicels, (d) size and lobing of calyx and corolla, (e) spacing of the inflorescences. As the plants proved variable in so many ways, it seemed advisable to return to the diagnostic characteristics used by Linnaeus, Bentham, Briquet, Fernald, and Piper, namely, leaf-shape and degree of hairiness. As there were more than 500 specimens of *Mentha arvensis* or its varieties from Alaska, Canada, Newfoundland and the majority of states of the United States in the Gray Herbarium, no specimens from other herbaria were examined. I wish to acknowledge the patient guidance and help of Professor M. L. Fernald throughout this study.

Key to Varieties

Leaves, in region of inflorescences, ovate to elliptic, with more or less rounded bases . . . . . 1. *M. arvensis*, var. *typica*.
Leaves, in region of inflorescences, lanceolate, with more or less cuneate bases . . . . . 2. *M. arvensis*, var. *villosa*.

1. Mentha arvensis L., var. **typica.** *M. arvensis* L., Sp. Pl. 577 (1753).

Key to Forms of M. arvensis L., Var. typica

Stem, in region of first-flowering inflorescence, glabrous on sides, minutely pubescent on angles . . . . . 1a. f. *glabra*.
Stem, in region of first-flowering inflorescence, pubescent on sides and angles.
Angles of stem more pubescent than sides . . . . . 1b. f. *typica*.
Angles and sides of stem more or less equally pubescent.
Hairs 1–3.5 mm. long, spreading . . . . . 1c. f. *lanata*.
Hairs 0.2–1.5 mm. long, appressed . . . . . 1d. f. *puberula*.

1a. Forma **glabra** (Bentham), stat. nov. Stem, in region of first-flowering inflorescence, glabrous on sides, glabrous (rare) or with hairs rarely longer than 1 mm. on angles; petioles and lower surfaces of leaves glabrous to slightly pubescent. *M.*

[1] Now Mrs. George Metcalf Hinckley.

arvensis L., ♂ *glabra* Benth., Lab. Gen. Sp. 179 (1833).—Newfoundland: *Fernald, Long & Fogg*, no. 1974; *R. B. Kennedy*, no. 531. Quebec: *Victorin, Germain & Meilleur*, no. 43987; *Fernald & Pease*, no. 25256. Magdalen Islands: *Fernald, Long & St. John*, no. 7982. Maine: Rumford, 1890, *J. C. Parlin*. Massachusetts: Aug. 1, 1908, *Burnham*. New York: Sept. 5, 1909, *Watrous & Burnham*. Pennsylvania: Aug. 20, 1915, *I. W. Anderson*. West Virginia: *Greenman*, no. 243. Ohio: *R. J. Webb*, no. 6. Wisconsin: *Fassett & Wilson*, no. 5518. Illinois: Aug. 1886, *Robinson*. Kansas: *Rev. J. M. Bates*, no. 4594. Washington: *Vasey*, no. 463.

1b. Forma **typica.** Angles of stem, in region of first-flowering inflorescence, always more pubescent than sides, petioles, lower surfaces of leaves, and stem slightly to very pubescent.—Widely distributed, partly naturalized from Europe, partly apparently indigenous, Southern Labrador to Washington, south to Newfoundland, Nova Scotia, New England, Virginia, Kentucky, Nebraska, Colorado and California.

1c. Forma **lanata** (Piper), stat. nov. Stem, in region of first-flowering inflorescence, more or less equally pubescent on angles and sides, hairs 1–3.5 mm. long, spreading; petioles and lower surfaces of leaves more or less densely pubescent. *M. arvensis* L., var. *lanata* Piper, Bull. Torr. Bot. Club **29:** 223 (1902).—Newfoundland: Sept. 15, 1937, *B. W. Brooks*. Quebec: Aug. 4, 1902, *J. R. Churchill*. New Brunswick: *Victorin, Germain & Jacques*, no. 44658. Nova Scotia: *St. John*, no. 1313. Maine: Sept. 1, 1902, *G. G. Kennedy;* July 14, 1909, *Fernald;* Sept. 15, 1904, *O. W. Knight*. New York: June 29, 1910, *Burnham*. Pennsylvania: July 19, 1926, *W. M. Benner*. Ontario: Aug. 20, 1914, *Eames & MacDaniels*. Idaho: 1861, *Dr. Lyall; Sandberg, MacDougal & Heller*, no. 734. California: *Mrs. R. F. Bingham*, no. 8; Aug. 16, 1882, *Pringle;* June 1894, *R. D. Alderson; Abrams*, no. 4069. Washington: *Lake & Hull*, no. 603.

1d. Forma **puberula,** forma nov. Regione primae florigerae inflorescentiae capillis plus minusve aeque ad latera et angulos caulis distributis puberula; capillis 0.2–1.5 mm. longis, adpressis; petiolis paginaque inferiore foliorum puberulentibus.—Pennsylvania: McCall's Ferry, York Co., Oct. 15, 1892, *Heller & Halbach*, no. 641 (type in Gray Herb.). Idaho: Boise, July 27, 1911, *J. A. Clark*, no. 154; ("Oregon") Clearwater, *Rev. Mr. Spalding*. Wyoming: Sybille Creek, Albany Co., July 3, 1900, *A. Nelson*, no. 7383. Utah: Uinta Basin, along irrigation ditch west of Vernal, Uinta Co., Sept. 4, 1931, *Graham*, no. 7416. California: Fort Tejon and vicinity, near lat. 35° & long. 119°, 1857–8, *de Vesey*, no. 76; *Hartweg*, no. 1910; Yosemite Valley, Mariposa Co., Aug. 8, 1891, *Coville & Funston*, no. 1852. Oregon: Trout Creek, base of Stein's Mts., July 18, 1898, *Cusick*, no. 2043.

2. Mentha arvensis L., var. **villosa** (Benth.), comb. nov. *M. canadensis* L. Sp. Pl. 577 (1753). *M. borealis* Michaux, Fl. Bor.-Am. **2**: 2 (1803). *M. arvensis*, α. *villosa* Benth. Lab. Gen. et Sp. 181 (1833). *M. arvensis* L., var. *canadensis* (L.) Briquet, Bull. Herb. Boiss. **2:** 707 (1894).

Key to Forms of M. arvensis L., Var. villosa

Stem, in region of first-flowering inflorescence, glabrous on sides, minutely pubescent on angles.....2a. f. *glabrata.*
Stem, in region of first-flowering inflorescence, pubescent on sides and angles.
Angles of stem more pubescent than sides.....2b. f. *typica.*
Angles and sides of stem more or less equally pubescent.
Hairs 1–3 mm. long, spreading.....2c. f. *lanigera.*
Hairs 0.2–1.5 mm. long, appressed.....2d. f. *brevipilosa.*

2a. Forma **glabrata** (Bentham), stat. nov. Stem, in region of first-flowering inflorescence, glabrous on sides, glabrous (rare) or with hairs rarely longer than 1 mm. on angles; petioles and lower surfaces of leaves glabrous to slightly pubescent.—*M. canadensis* L., β. *glabrata* Benth., Lab. Gen. Sp. 181 (1833). *M. arvensis* L., var. *Penardi* Briquet, Bull. Herb. Boiss. **3:** 215 (1895). *M. arvensis* L., var. *glabrata* (Benth.) Fernald, Rhodora **10:** 86 (1908).—Widely ranging from Labrador to British Columbia, south to Magdalen Islands, New Brunswick, New England, Maryland, West Virginia, Ohio, Michigan, Illinois, Missouri, Kansas, New Mexico, Arizona and California.

2b. Forma **typica.** Angles of stem, in region of first-flowering inflorescence, always more pubescent than sides; petioles, lower surfaces of leaves, and stem slightly to very pubescent.—Newfoundland to Alaska, south to Nova Scotia, New England, Virginia, Ohio, Indiana, Illinois, Minnesota, Nebraska, New Mexico and California.

2c. Forma **lanigera,** forma nov. Regione primae florigerae inflorescentiae, capillis plus minusve aeque ad latera et angulos caulis distributis lanosa; capillis 1–3 mm. longis, patentibus; petiolis paginaque inferiore foliorum dense puberulentibus.—Maine: Fort Fairfield, Aroostook Co., July 16, 1902, *Williams, Collins & Fernald;* Fort Fairfield, Aroostook Co., Aug. 10, 1909, *Fernald.* Vermont: Charlotte, Sept. 23, 1879, *Pringle.* Idaho: Valley of N. Fork of Coeur d'Alene Riv., region of Coeur d'Alene Mts., Aug. 14, 1895, *J. B. Leiberg,* no. 1540. California: From Fort Bragg to Glen Blair, Mendocino Co., Aug. 8–16, 1912, *Eastwood,* no. 1666 (type in Gray Herb.). Oregon: Wet sand along Ten Mile L., Lakeside, Coos Co., Aug. 2, 1919, *Peck,* no. 9018. Washington: western Washington, June 1922, *J. M. Grant;* margin of an epsom lake north of Chelan, Chelan Co., June 25, 1931, *Thompson,* no. 6913; Lake Tucker, San Juan Islands, June 25–Aug. 1, 1917, *S. M. & E. B. Zeller,* no. 976.

ALASKA: Prince of Wales Island, Klawak Lake, Sept. 12, 1915, *Mr. & Mrs. E. P. Walker*, no. 993.

2d. Forma **brevipilosa,** forma nov. Regione primae florigerae inflorescentiae, capillis plus minusve aeque ad latera et angulos caulis distributis; breviter pilosa; capillis 0.2–1.5 mm. longis, adpressis; petiolis paginaque inferiore foliorum puberulentibus. *M. rubella* Rydberg, Mem. N. Y. Bot. Gard. **1:** 337 (1900).—SASKATCHEWAN: Lake Manitou, along the line of the Grand Trunk Pacific Railway, July 21, 1906, *Macoun & Herriot*, no. 78405; Saskatchewan, 1858, *E. Bourgeau.* ALBERTA: Castle Hill District, vicinity of Rosedale, July 27, 1915, *M. E. Moodie*, no. 1129; Loc Craigmyle, July 10, 1922, *A. H. Brinkman*, no. 709; Gov. Hay Camp district, Slave River, about 59° 31′ N., 111° 28′ W., Wood Buffalo Park, Mackenzie Basin, Aug. 8, 1928, *Raup*, no. 3163. MONTANA: Glacier National Park, Teton Co., July 22–28, 1913, *Hunnewell*, no. 2079; *Kirkwood*, no. 2204. IDAHO: (Oregon) River side (probably near Lapwai), June 14, *Rev. Mr. Spalding.* WYOMING: Lower Geyser Basin, Yellowstone Park, Aug. 4, 1897, *Rydberg & Bessey*, no. 4900; Jackson's Lake, Aug. 4, 1901, *Merrill & Wilcox*, no. 1133; Fort Steele, Carbon Co., Aug. 19, 1901, *Goodding*, no 542. UTAH: Uinta Basin, east side of Green River, 20 miles south of Vernal, Uinta Co., June 21, 1931, *Graham*, no. 6203. CALIFORNIA: Kaweah River Bottom, Tulare Co., July 5, 1904, *Culbertson*, no. 4204; San Joaquin Valley, Porterville, July 31, 1915, *Abrams;* Pine Grove, Amador Co., July 1895, *G. Hansen*, no. 140; Stubbs Flatt, Lake Co., Oct. 20, 1900, *A. Bowman;* Walker's Basin, Sept. 1875, *Rothrock;* Mendocino, Mendocino Co., Aug. 1898, *H. E. Brown*, no. 870; Sacramento Valley about 6 miles northwest of Chico, Butte Co., July 11, 1914, *Heller*, no. 11561 (TYPE in Gray Herb.). WASHINGTON: Prosser, Yakima Co., July 11, 1902, *J. S. Cotten*, no. 654; near Wenatchee, Chelan Co., June 24, 1931, *Thompson*, no. 6888. BRITISH COLUMBIA: Shawnigan Lake, Vancouver Island, Aug. 7, 1921, *Hunnewell*, no. 7887. ALASKA: Nulato, 1916, *J. A. Kusche;* Circle Hot Springs, near Steese Highway about 138 miles north of Fairbanks, July 17–22, 1936, *E. Scamman*, no. 404; Burroughs Bay, Sept. 19, 1915, *Mr. & Mrs. E. P. Walker*, no. 1013.

Mentha arvensis var. *villosa* (var. *canadensis*), confined chiefly to North America, differs from *Mentha arvensis* var. *typica*, found in general throughout the north temperate region of the world, only in its leaf-shape and less extensive range. In some cases, however, the leaf-shape is somewhere between the ovate type with rounded base of *M. arvensis* var. *typica* and the lanceolate type with cuneiform base of *M. arvensis* var. *villosa.* One does not know whether to assign plants with this intermediate type of leaf-shape to var. *typica* or var. *villosa.* The

amount of pubescence on the stems, leaves, petioles and calyces passes through a similar curve of variation, in this case from a glabrate to a short-haired and a long-haired form in both var. *typica* and var. *villosa*. In as polymorphic a species as *M. arvensis* this is not unexpected. I do not, therefore, feel that these extremes of variation merit varietal rank. Such being the case I have reduced former varieties to forms and proposed parallel forms for *M. arvensis* var. *typica* and *M. arvensis* var. *villosa*.

Piper states in his description of *M. arvensis* var. *lanata* that this variety has the size and habit of *M. arvensis* var. *villosa*. An examination of Piper's isotype discloses a plant with the type of leaf-shape which could be determined as either *M. arvensis* var. *typica* or *M. arvensis* var. *villosa*, tending, however, more towards var. *typica*. Of the seven specimens Piper cites, five are represented in the Gray Herbarium, and these I have found to be closer in leaf-shape to var. *typica* than to var. *villosa*. *M. arvensis* var. *lanata* has, therefore, been reduced to a form of *M. arvensis* var. *typica*, a parallel form being defined for *M. arvensis* var. *villosa*.

The two new forms, *M. arvensis*, var. *typica*, forma *puberula*, Pennsylvania, Idaho, Wyoming, Utah, California, Washington, and *M. arvensis* var. *villosa* forma *brevipilosa*, Saskatchewan, Alberta, Montana, Idaho, Wyoming, Utah, California, Washington, Vancouver Island, Alaska, seem to have a fairly definite geographical range. I do not, however, think they are varieties but rather forms, similar to var. *typica*, f. *lanata* and var. *villosa*, f. *lanigera* but possessing shorter hairs. There are also occasions when it is difficult to separate var. *typica*, f. *lanata* from var. *typica*, f. *puberula* and var. *villosa*, f. *lanigera* from var. *villosa*, f. *brevipilosa*. If more specimens from the Middle West and Middle Atlantic states had been available I believe var. *typica*, f. *puberula* and var. *villosa*, f. *brevipilosa* would be found to have a more extensive range.

M. arvensis L., var. *Pavonia* Briquet (Mexico) and *M. arvensis* L., var. *Schmitzii* Briquet (New Mexico), described by Briquet, Bull. Herb. Boiss. **2:** 708 (1894), were not studied as there were no cited specimens available. *M. arvensis* L., var. *occidentalis* (Rydb.) Jones, *M. occidentalis* Rydberg, Bull. Torr. Club **36:** 687 (1907), was omitted for the same reason.

Alexandria, Virginia.

THE AUTHORSHIP OF SCIRPUS ATROVIRENS.—Traditionally the credit for the original description of *Scirpus atrovirens* is given to Muhlenberg in Descr. Gram. 43–44. 1817. In this publication Muhlenberg himself gives credit for the description of the plant to Willdenow. In the latter's Enum. Pl. (1809) on page 79 is the original description of *Scirpus atrovirens* and Willd. should replace Muhl. where reference is made to the original authorship.—A. A. BEETLE, Division of Agronomy, University of California, Davis, Calif.

MODIOLA CAROLINIANA IN MASSACHUSETTS.—In April, 1938 our attention was called to a malvaceous plant which had appeared in a recently seeded lawn near the Goodell Library on the Massachusetts State College Campus, and which we identified as *Modiola caroliniana* (L.) G. Don, a plant which normally ranges from Virginia southward into the Tropics. Thinking it to be only a stray, destined to disappear promptly, we gave it no further thought till this year, when it was again called to our attention. We find that it has now become a "foundation planting" extending for several feet along the underpinning of the building and forming a tangle of harsh, wiry branches which root at the nodes and fruit abundantly. Outward from the wall it has adapted itself to the lawn-mower by spreading into a tough mat-weed. Several feet away from it grows a flourishing colony of *Cynodon Dactylon* (L.) Pers., the Bermuda grass which, though reported for Massachusetts, is scarcely a normal part of our flora.

The secret of such aberrant behavior on the part of two southern species is not far to seek. They are growing in soil over the steam pipes. Incidentally they must be highly drought-resistant plants since the soil at this season is dust dry.

This appears to be the first record of *Modiola caroliniana* in Massachusetts and we are happy to deposit a sheet of the plant in the Gray Herbarium.—R. E. TORREY, Massachusetts State College, Amherst.

Volume 46, no. 548, including pages 285–316 and plates 836 and 837, was issued 17 August, 1944.

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